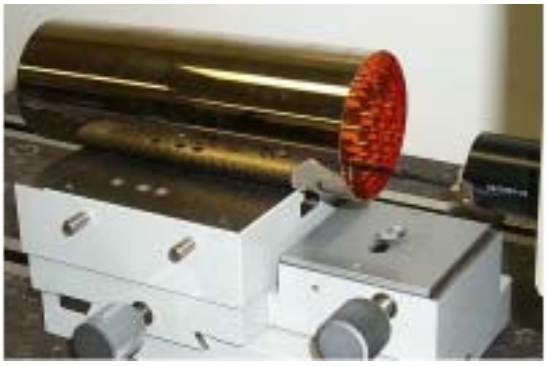
Precision Metrology Laboratory

Purpose:

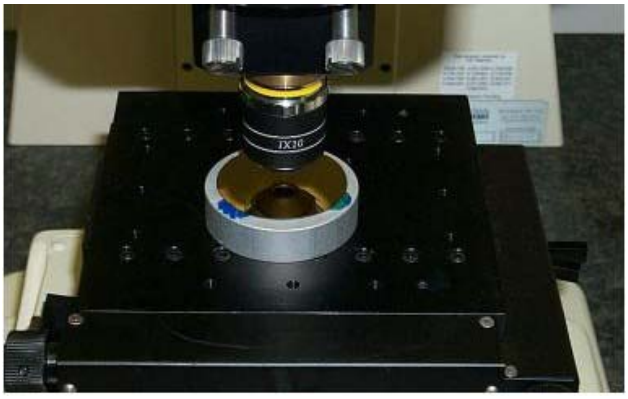
To provide precision metrology for tribology research and related center needs.

The precision metrology lab has its roots from the Army Ballistic Missile Agency days in the 50's and the original team of German rocket scientists. More recently the lab has been used to measure very precise, high-speed, rocket turbopump bearings. With improvements in hybrid ceramic bearing technology, the tolerances and amounts of wear are often extremely minute. Still, with the use of state of the art stylus profilometry and non-contact optical interferometry, wear can be detected in nanometers, and sometimes to angstroms!



To augment such precise quantification of wear, the highest quality, apochromatic microscopes are available to let the experienced researcher visually assess wear surfaces and record them via various media formats including high resolution digital images. Other specialized metrology equipment includes AA "master" gage blocks of chromium carbide and Zerodur®, master ball sets, optical flats, plug and ring gages, screw and gear measuring wires, numerous height gages, master vernier calipers, unique micrometers, optical shadowgraphs, precision electronic levels, autocollimator, surface plates – almost a complete metrology shop! The laboratory is located in a 100k-class clean room in 4711, though higher cleanliness could be readily arranged.

As much of the equipment and expertise is unique to the center, there has been much help provided to other directorate projects in need of precise surface metrology. Examples include measurement of replicated x-ray optics, crystal growth samples, friction stir welding tools, sealing surfaces of International Space Station modules, turbine blade fretting wear, unlubricated polyimide gear wear, to name a few.



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